

# MISCELLANEOUS PAPERS

Centre for Entomological Studies Ankara

No 172

16 April 2018

ISSN 1015-8235

<http://zoobank.org/urn:lsid:zoobank.org:pub:288DFF3D-E652-4877-AAE9-6C1A24C7AB74>

## Some molecular phylogenetic and taxonomical remarks on the *Gnophini* of Turkey, with faunistical notes (*Lepidoptera, Geometridae, Ennominae*)

Muhabbet Kemal<sup>1</sup> Sibel Kızıldağ Ahmet Ömer Koçak

**Abstract:** Some molecular phylogenetic and taxonomical remarks on the *Gnophini* of Turkey, with faunistical notes (*Lepidoptera, Geometridae, Ennominae*). *Misc. Pap.* 172: 1-15, 1 fig.

In this paper, three genera of *Gnophini* in Turkey, *Charissa*, *Gnophos*, and *Odontognophos* are discussed from taxonomical, molecular and faunistical standpoints. Totally 37 species are reported from Turkey. Two species are recorded here as new to the Lepidoptera fauna of Turkey.

**Keywords:** Lepidoptera, Geometridae, Ennominae, Gnophini, taxonomy, phylogeny, fauna, Turkey.

## Introduction

In order to understand better the faunistic structure of the Lepidoptera of Turkey, intensive researches have been carrying out by the authors during the last decades, under the project entitled “Lepidoptera of Turkey (LTR)”<sup>2</sup>. Most of the faunistic studies carried out for this purpose have already been published. The last ten selected from among the many are as follows; Kemal, Koçak & Uçak (2018); Kemal & Koçak (2016, 2018a-c, 2017a-c); Kemal, Kızıldağ & Koçak (2018a-b). Four taxonomical papers on Pyralidae, Oecophoridae, and Geometridae were published recently (Kemal & Koçak, 2017d-e; Kemal, et al., 2018; Kemal & Uçak, 2018). Besides, Kemal, Koçak & Uçak (2017) reported some *Charissa* (=*Hyposcotis*) spp. from Dağlıca (Hakkari Pr.). Seven (2018) reported several faunistical records of *Gnophini* species from South-East Turkey. Some records especially from East Turkey are based upon the images mentioned in the Bold Systems. However, their DNA barcodes or their collecting labels cannot be accessible.

The present paper comprises 37 species of the genera *Charissa*, *Gnophos* and *Odontognophos* of Turkey. Two species are new for the Lepidoptera fauna of Turkey. Many provincial records are also new. The original references, synonyms, and brief distributional information are added to each species. The range is mainly based upon the Info-system of the Cesa<sup>3</sup>.

<sup>1</sup> Dr. Muhabbet Kemal & Dr. Sibel Kızıldağ - Van Yüzüncü Yıl University, Faculty of Science, Dept. of Biology, Campus, Van / Turkey.  
e-mails: [muhabbet\\_kemal@yahoo.com.tr](mailto:muhabbet_kemal@yahoo.com.tr) - [sibelkizildag@vyy.edu.tr](mailto:sibelkizildag@vyy.edu.tr)

Prof. em. Dr. Ahmet Ömer Koçak, c/o Yüzüncü Yıl University, Faculty of Science, Dept. of Biology. e-mail: [cesa\\_tr@yahoo.com.tr](mailto:cesa_tr@yahoo.com.tr)

<sup>2</sup> <https://www.researchgate.net/project/Lepidoptera-of-Turkey-LTR>

<sup>3</sup> <http://www.cesa-tr.org/Infos.htm> The database information of the authors is private; therefore publicly inaccessible.

## Material and Method

### Molecular analysis

The processes made before obtained genomic DNA from the dry legs of the specimens, as well as gDNA of *Charissa* was extracted using RED Extract-N-Amp Tissue PCR Kit (Sigma, St. Louis, MO, USA) according to Kemal et al. (2018). The PCR amplifications of mtCOI sequences were performed with LepF1 and LepR1 primers. Purification and sequencing of PCR products was performed by Macrogen (Netherlands). Obtained sequences aligned and evaluated other close taxa by MEGA7 (Kumar, Stecher & Tamura, 2016). Phylogenetic relationships were determined by maximum likelihood and Bayesian inference analyses. The maximum likelihood analysis was conducted using RAxML-Blackbox on XSEDE by CIPRES Science Gateway website ([http://www.phylo.org/sub\\_sections/portal](http://www.phylo.org/sub_sections/portal)). The Bayesian inference analysis was performed with MrBayes v3.2.3 (Ronquist & Huelsenbeck, 2003).

### Gnophini material

The *Gnophini* specimens were collected by the authors from various parts of Turkey not only in the past, but also in this year. They were prepared and labelled in the museum standard. All the collected specimens are currently preserved in the Cesa Collection<sup>4</sup>.

Their morphological identifications are mostly based upon the genitalic structures. The specimens, belonging to 22 species, are mentioned in the following text.

## Results

### Molecular phylogenetic evaluations

In the tree of the Bayesian Interference (BI) and the Maximum Likelihood (ML) illustrated together (Fig.1), basing upon the mtCOI gene sequences of some *Charissa* and *Gnophos* species of the Genbank and Bold Systems (Ratnasingham, S. & P.D.N. Hebert, 2007), publicly available. The mtCOI gene sequences of two *Charissa dubitaria* populations from Van Province (1,2) and of an unknown species of *Charissa* from Anamur (İçel Province) are also included and evaluated here. The results are mentioned below briefly.

1. About the identities of two populations of *Charissa dubitaria-1* & *Charissa dubitaria-2* versus *Charissa pseudodubitaria*. *Charissa pseudodubitaria* is an apparently unpublished name of a species from Israel and Iran. The two populations of *dubitaria* specifically same, but different from *pseudodubitaria*. The tree supports the locations of both taxa in a sister position.
2. Two populations of *Charissa dubitaria* from Van and the populations of *Charissa dubitaria staudingeri* are the members of the same major clade, but placed in different subclades. Some authors consider *dubitaria* and *staudingeri* as conspecific and different at subspecific level. The tree under discussion does not support this opinion. Moreover, *staudingeri* in a sister position with *assoi* and *corsica* (see also taxonomical evaluation below).
3. Status of *Charissa* sp. n.  
This taxon appears as a species of *Charissa* morphologically. Even though, it seems to have abandoned its own genus; in other words, it conglomerates superficially with an unrelated species, i.e., *Gnophos sartatus*. In brief, the *Charissa* taxon is a distinct, apparently new species. Moreover, it may belong to a distinct genus. The tree supports clearly this argument.

<sup>4</sup> <http://grbio.org/cool/eaaz-xyfc> <http://grbio.org/cool/d36c-mrxe>

**4. Status of the genus *Gnophos* Tr.**

In this genus, the morphological and molecular data do not seem to be compatible. There is a chaotic situation that is not easy to explain. At the same time, the affinity between *sartatus* and #*furvatus* (type-species) is also an issue of controversial.

**5. Status of *Charissa mutilata***

The *mutilata* populations mentioned in the tree are clearly close to each other. However, the *mutilata* population is so close to *peloponnesaria* that falls human doubt. The next two populations of *mutilata* seems to be different species. The present tree supports this opinion.

**6. Status of *Charissa certhiata* in Turkey**

From the molecular standpoint, there is no discrepancy between *certhiata* and other related species. However, some populations of *certhiata* in East Turkey must be studied morphologically, molecular assisted.

**7. Status of *Neognophina* in Turkey**

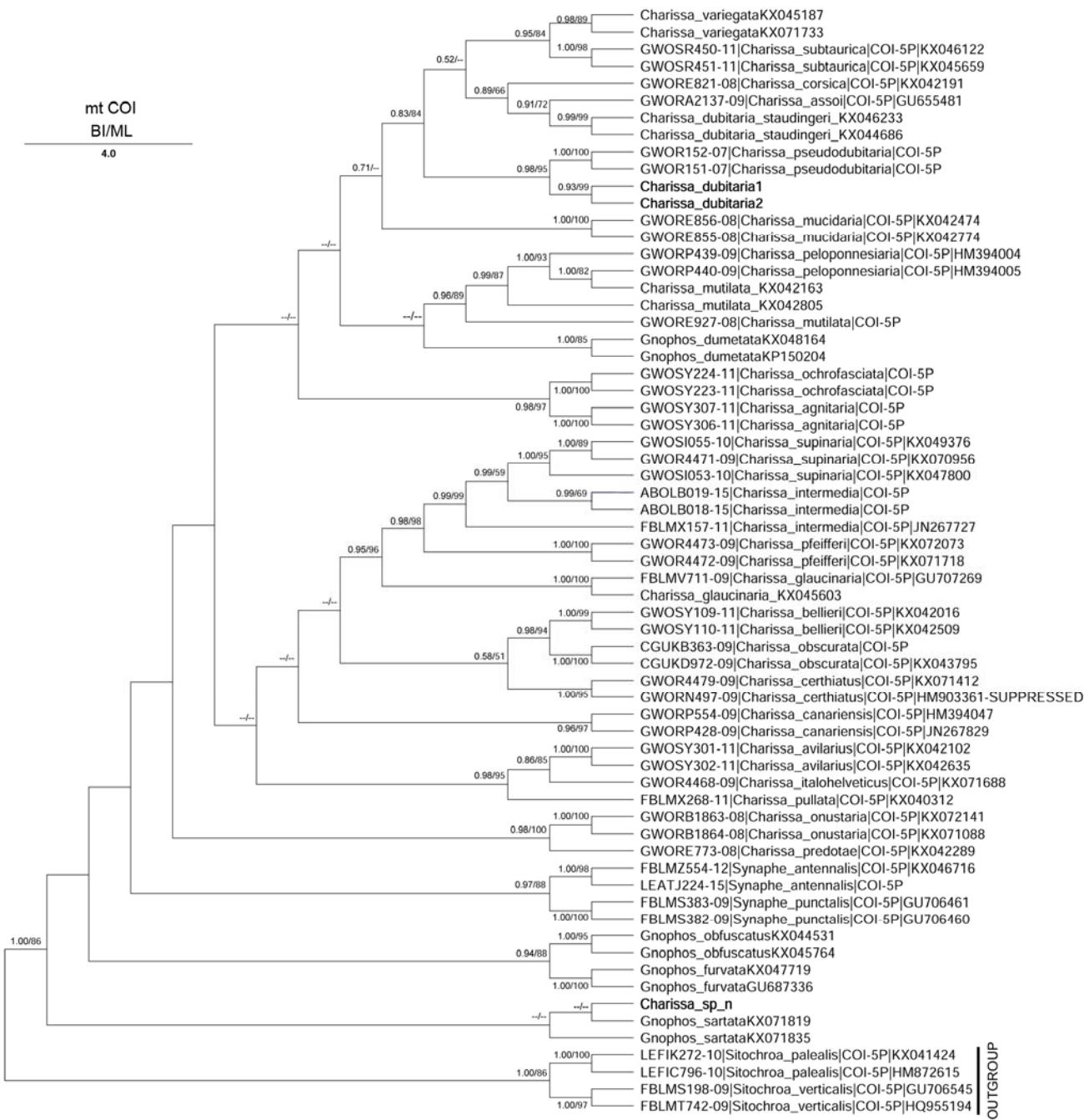
The subgenus was established by Wehrli (1951) with the type-species *Gnophos intermedia* Wrli. Currently, two species of the subgenus, *supinaria* and *intermedia* are represented in the Balkans, both currently unknown from Turkey. The sole species of the subgenus, occurring in Turkey is *pfeifferi*. There is also an unidentified population of *Neognophina* from South Turkey. The members of this subgenus need more morphological and molecular studies in future.

**8. Status of *Odontognophos dumetata***

Wehrli (1951) established *Odontognophos* as a distinct genus from *Gnophos* Treitscke with the type-species *Gnophos dumetata*, described by Treitschke (1827), by using the morphological features of the adult, as well as the early stages of this insect. Some authors follow Wehrli's argument, others do not take this into account. In the Lepiforum, the species *dumetata* is placed in the genus *Gnophos* Treitschke (1825). The genus *Gnophos* is represented by the type-species #*Geometra furvata* [Denis & Schiffermüller], 1775. In the tree (Fig.1), the location, where these two taxa placed are very far from each other. Therefore, *furvatus* and *dumetatus* are not congeneric, and this argument is strongly supported by the tree illustrated. On the other hand, *dumetata* is closer to *mutilata* and allied species, currently represented by the subgenus *Cnestrognophos*. It means that there is an incompatible case from the morphological and molecular standpoints. Under these circumstances, new evaluations are necessary, based upon more new data. Finally, it can be said that *Charissa* and *Gnophos* are not monophyletic, and this case play an important role on this problematic matter.

**9. Status of Outgroup**

*Synaphe* and *Sitochroa* are the generic members of the family *Pyralidae* and *Crambidae* in the superfamily *Pyraloidea*. These families and *Geometridae* are well established different taxonomic groups under two different superfamilies, *Pyraloidea* and *Geometroidea*, respectively. In the present study, *Synaphe* and *Sitochroa* were selected as outgroup for the *Gnophini* tree. *Sitochroa* is seen in the tree at the correct position. However, *Synaphe* and *Charissa* approach to each other unexpectedly. The reason of this discrepancy may be the existence of a large number of taxa, still undescribed, or the morphological characters, used in definition of the related family group taxa, cannot sufficiently represent during molecular analyses. This is not a defense, but a comment (See also remark no 8).



**Fig. 1** - Maximum-likelihood (ML) and Bayesian inference (BI) analyses based on mt COI gene sequences of some *Charissa* and *Gnophos* species (*Ennominae*, *Geometridae*).

The new sequences in the presented tree are indicated in bold. Posterior probabilities of Bayesian inference (BI) and bootstrap values of maximum likelihood (ML) are presented on each interior branch. Dashes denote a value showing less than half of the full posterior probability or bootstrap value. For the position of the outgroup in the tree, see remark no 9.

## Taxonomical evaluations

By taking the remark no.2 into consideration mentioned above, we propose here the taxon *staudingeri* as a distinct species in the genus *Charissa*, near *assoi* and *corsica*. *Charissa staudingeri* (Wnukowsky, 1929) (**stat.n.**) is currently considered as a subspecies of *Charissa dubitaria* (Stgr.) (Lepiforum, latest access on 13 April, 2018).

An unnamed *Charissa* species from Anamur is discussed above (remark no.3). For its precise identification further morphological researches, molecular assisted, will be carried out in the near future.

In this paper, three genera, *Charissa*, *Gnophos*, and *Odontognophos* are studied by the authors for the first time. According to the remarks (no 4, 8), all these genera are incompatible from not only the morphological, but also molecular standpoints. While this is the case, on the existing subgeneric classification and about its nomenclature, there are, nevertheless, some important points that need to be expressed.

The following subgenera of the genus *Charissa* are currently known in Turkey. These are: *Cnestrognophos*, *Euchrognophos* (=*Hyposcotis*), *Kemtroggnophos*, *Neognophina*, *Organognophos*, *Rhopalognophos*, and *Charissa* s.str. The genus *Gnophos* is represented in Turkey by three subgenera: *Dicrognophos*, *Sacroggnophos*, and *Gnophos* s.str. Finally, the genus *Odontognophos* has no subgenus.

Taxonomical synopsis of the *Gnophini* of Turkey and adjacent countries are given below:  
The symbol # denotes nomenclaturally unavailable name.

### ***Gnophini* Duponchel, [1845]**

*Gnophites* Duponchel, [1845], Cat. Méth. Lépid. Eur.: 226-227. Type-genus: *Gnophos* Tr.

### ***Charissa* Curtis, 1826**

The subgeneric division of this genus was proposed by Wehrli (1951, 1953). They are mentioned below in alphabetical order (see also Koçak & Kemal, 2015):

***Charissa (Cnestrognophos)* Wehrli, 1951** Original reference: *Gnophos (Cnestrognophos)* Wehrli, 1951, Lambillionea 51: 26. Type-species: *Gnophos praeacutaria* Wehrli, 1922, by original designation. Synonyms: *Cnestrognophos* Wehrli, 1951; *Cnestrognophos* Wehrli, 1953

***Charissa (Costignophos)* Wehrli, 1951** Original reference: *Gnophos (Costignophos)* Wehrli, 1951, Lambillionea 51: 23. Type-species: *Geometra pullata* [Denis & Schiffermüller], 1775, by original designation. Synonym: *Costignophos* Wehrli, 1951

***Charissa (Dysgnophos)* Wehrli, 1951** Original reference: *Gnophos (Dysgnophos)* Wehrli, 1951, Lambillionea 51: 23. Type-species: *Gnophos difficilis* Alpheraky, 1883, by original designation. Synonym: *Dysgnophos* Wehrli, 1951

***Charissa (Euchrognophos)* Wehrli, 1951** Original reference: *Gnophos (Euchrognophos)* Wehrli, 1951, Lambillionea 51: 25. Type-species: *Gnophos variegata* Duponchel, 1830, by original designation. Synonyms: *Hyposcotis* Hübner, [1825]; *Euchrognophos* Wehrli, 1951; *Euchrognophos* Wehrli, 1953 (The priority belongs to *Hyposcotis* Hübner, [1825]).

***Charissa (Kemtroggnophos)* Wehrli, 1951** Original reference: *Gnophos (Kemtroggnophos)* Wehrli, 1951, Lambillionea 51: 11. Type-species: *Gnophos onustaria* Herrich-Schäffer, [1852], by original designation. Synonyms: *Kemtroggnophos* Wehrli, 1951; #*Kentroggnophos* Wehrli, 1951

***Charissa (Neognophina)* Wehrli, 1946** Original reference: *Gnophos (Neognophina)* Wehrli, 1946, Revue fr. Lépid. 10: 241. Type-species: *Gnophos intermedia* Wehrli, 1917, by original designation. Synonyms: *Neognophina* Wehrli, 1946; *Neognophina* Wehrli, 1951; *Neognophina* Wehrli, 1953  
(For previous taxonomical arrangement of this group, see: Wehrli (1921)).

***Charissa (Organognophos)* Wehrli, 1951** Original reference: *Gnophos (Organognophos)* Wehrli, 1951, Lambillionea 51: 24. Type-species: *Gnophos sibirata* Guenée, 1857, by original designation. Synonyms: *Organognophos* Wehrli, 1951; *Organognophos* Wehrli, 1953

***Charissa (Rhopalognophos)* Wehrli, 1951** Original reference: *Gnophos (Rhopalognophos)* Wehrli, 1951, Lambillionea 51: 24. Type-species: *Geometra glaucinaria* Hübner, [1799], by original designation. Synonyms: *Rhopalognophos* Wehrli, 1951; *Rhopalognophos* Wehrli, 1953

***Charissa (s.str.)* Curtis, 1826**  
Original reference: *Charissa* Curtis, 1826, Br. Ent. 3: pl.105. Type-species: #*Geometra obscurata* [Denis & Schiffermüller], 1775, Ankündung syst. Werkes Schmett. Wienergegend: 108. Type(s): [Austria]: Vienna district [nomen nudum]. Synonym: *Charissa* Curtis, 1826

***Charissa (Trilobignophos)* Wehrli, 1951** Original reference: *Gnophos (Trilobignophos)* Wehrli, 1951, Lambillionea 51: 23. Type-species: *Gnophos pollinaria* Christoph, 1887, by original designation. Synonyms: *Trilobignophos* Wehrli, 1951; *Trilobignophos* Wehrli, 1953

***Gnophos* Treitschke, 1825**

Original reference: *Gnophos* Treitschke, 1825, [in] Ochsenheimer, Schmett. Eur. 5 (2): 432. Type-species: #*Geometra furvata* [Denis & Schiffermüller], 1775, [nomen nudum], by subsequent designation by Duponchel, 1829 [in] Godart & Duponchel, Hist. Nat. Lépid. Papillons Fr. 7 (2): 110. Synonym: *Gnophos* Treitschke, 1825

***Gnophos (Dicrognophos)* Wehrli, 1951** Original reference: *Gnophos (Dicrognophos)* Wehrli, 1951, Lambillionea 51: 10. Type-species: *Gnophos orthogonia* Wehrli, 1939, Mitt. münchen. ent. Ges. 29: 72, by original designation. Synonym: *Dicrognophos* Wehrli, 1951

***Gnophos (Sacrognophos)* Wehrli, 1951**

Original reference: *Gnophos (Sacrognophos)* Wehrli, 1951, Lambillionea 51: 11. Type-species: *Gnophos sacraria* Staudinger, [1895], by original designation. Synonym: *Sacrognophos* Wehrli, 1951

***Gnophos (s.str.)* Treitschke, 1825**

Original reference: *Gnophos* Treitschke, 1825, [in] Ochsenheimer, Schmett. Eur. 5 (2): 432. Type-species: #*Geometra furvata* [Denis & Schiffermüller], 1775, [nomen nudum], by subsequent designation by Duponchel, 1829 [in] Godart & Duponchel, Hist. Nat. Lépid. Papillons Fr. 7 (2): 110. Synonym: *Gnophos* Treitschke, 1825

***Odontognophos* Wehrli, 1951**

Original reference: *Odontognophos* Wehrli, 1951, Lambillionea 51: 29. Type-species: *Gnophos dumetata* Treitschke, 1827, by original designation. Synonym: *Odontognophos* Wehrli, 1951

Faunistical evaluations

Below, 37 species from Turkey are mentioned. Among them, two species are reported here as new for the fauna of Turkey.

**1. *Charissa (Cnestrognophos) adjectaria* (Staudinger, [1898])**

Original reference: *Gnophos adjectaria* Staudinger, [1898], Dt. Ent. Z., Iris 10: 312-314, Taf.iv fig.35. Syntypes 4♂ 2♀: "Jordanthal".

Synonym: *adjectaria* Staudinger, [1898]

Range: Turkmenistan, Uzbekistan, Israel, Turkey (Batman) (Seven, 2018).

**2. *Charissa (Cnestrognophos) anthina* Wehrli, 1953**

Original reference: *Gnophos (Rhipignophos) anthina* Wehrli, 1953, [in] Seitz, A., Die Gross-Schmett. Erde 4 (Suppl.): 612, Fig.49i. Type: [Azerbaijan]: "Ordubad, gegen 1600m" leg. Rjabov (ZIN, St Petersburg).

Synonym: *anthina* Wehrli, 1953

Range: North Turkey (Bolu? [Özdemir, 2007]; Erzurum), Azerbaijan (Arax valley (Ordubad)) (Bold Systems).

**3. *Charissa (Cnestrognophos) libanotica* (Wehrli, 1931)**

Original reference: *Gnophos libanotica* Wehrli, 1931, Mitt. münchen. ent. Ges. 21: 45. Syntypes 10♂: Libanon: Bscharre, leg. E. Pfeiffer (ZSM).

Synonym: *libanotica* Wehrli, 1931

Range: Lebanon, Caucasus countries, Turkey (Antalya, Siirt, Van).

Material examined: 1♂. Antalya Pr. (Kohu Mt.), GP746♂, A.Koçak leg. & prep. 1985.

**4. *Charissa (Cnestrognophos) luticiliata* (Christoph, 1887)**

Original reference: *Gnophos luticiliatus* Christoph, 1887, [in] Romanoff, Mém. lépid. 3: 100-101, pl.v fig.3. Type ♂: [Turkmenistan]: "Askhabad".

Synonym: *luticiliatus* Christoph, 1887

Range: Middle East countries, Turkey (Van [present record]), North Iran, Turkmenistan.

Material examined: 2♂. Van Pr. Bahçesaray, Upper Mukus Valley 1800m (65Am2) 10.v.2016, GP2349, GP2938; 1♀. Same place 1840m (64Am4), 3.vi.2016; 5♂♀, same place 5.viii.2016, GP2937♂; 1♂. Same place, 10.vi.2016, all by M.Kemal & A.Koçak leg.

Remarks: The illustrated male genitalia (GP2349♂) of the unnamed specimen from Van (Bahçesaray) (Kemal & Koçak, 2016: fig.43) was kindly identified by Erlacher (pers. comm. in 2016) as *luticiliata* Chr.

New for the fauna of Turkey.

##### **5. *Charissa (Cnestrognophos) mutilata* (Staudinger, 1879)**

Original reference: *Gnophos mutilata* Staudinger, 1879, Horae Soc. ent. ross. 14: 457. Type ♂: [Türkei]: Amasia (Johann leg.).

Synonym: *mutilata* Staudinger, 1879

Range: Turkey (Amasya, Ankara, Bolu, Elazığ, Erzurum, Konya, Malatya, Kahramanmaraş, Mardin, Niğde, Sivas, Trabzon, Van), Caucasus countries.

Material examined: 26♂♀. **Malatya** Pr., Beydağı NP 1190m (44Lc), 25-28.iv.2015, GP2930♀, GP2931♂, GP2943♂; 1♂. Malatya Pr., Darende, Beybağı 1200m (44Ei), 30.viii.2017, GP2940♂; 1♂. **Van** Pr., Çatak, Saklıvadi (65Df), 25.vii.2016, GP2844♂; 1♂, Van Pr., Edremit, Elmalık (65Le) 25.viii.2017, GP2920♂; 5♂. **Bitlis** Pr., Adilcevaz, Süphan Mt. Kızdağı 2560m (13Ac1), 19.viii.2017, GP2941♂, all by M.Kemal & A.Koçak leg.

##### **6. *Charissa (Cnestrognophos) rjabovi* Wehrli, 1939**

Original reference: *Gnophos rjabovi* Wehrli, 1939, Mitt. münchen. ent. Ges. 29(1): 77. Holotype ♂: [Azerbaijan]: Ordubad, 1600-1700m.

Synonym: *rjabovi* Wehrli, 1939

Range: Turkey (Erzurum, Van [present record]), Caucasus countries, Arax valley, Iran.

Material examined: 2♂. **Van** Pr., Tuşba, Ağarti, Gören Mt. 1950m (65Np2), 25.v.2014; 2♂, Bahçesaray, Upper Mukus Valley 1800m, (65Am2), 10.v.2016, GP2350♂; 2♂, same district, Upper Mukus Valley 1840m (65Am4), 25.v.2016; 1♂, same place (65Am4) 10.vi.2016; 16♂3♀, same district and place, 3.vi.2016; 3♂, same district, Upper Mukus Valley 1760m (65Am1), 12.vi.2016; 14♂♀, Bahçesaray, Krapet Pass 3000m (65Abc) 16.vii.2017; 6♂♀, Çatak, Saklıvadi 2030m (65Df) 25.vi.2017, all by M.Kemal & A.Koçak leg.

##### **7. *Charissa (Euchrognophos) annubilata* (Christoph, 1885)**

Original reference: *Gnophos annubilata* Christoph, 1885, [in] Romanoff, Mém. lépid. 2: 103-104, pl.v fig.7. Type ♂: [Georgia]: "Khotchaldagh, près de Lagodekhi".

Synonym: *annubilata* Christoph, 1885

Range: Turkey (Rize, Siirt [Seven, 2018], Van, Şırnak [present records]), Caucasus countries, Iran.

Material examined: 1♂. **Şırnak** Prov., Beytüşşebap, Taşarası 1085m, 5.iv.2013, GP2939♂, M.Kemal & A.Koçak leg.; 1♂ [presumably], Van Çatak, Saklıvadi 2030m (65Df) 8.ix.2016, A.Koçak leg.; 1♂. **Van** Pr., Erek Mt. 2130m, GP2947, 9.iv.2018, M. Kemal & A.Koçak leg.; 1♂ (presumably belong to this species), Van Pr. Gevaş, Artos Mt. 2000m (65Fp), 15.iv.2018, M.Kemal & A.Koçak leg.

Remarks: Seven (2018) reported this species from Siirt (Şirvan) in October (second generation?). The specimens collected from Şırnak and Van Provinces (see above) are both vernal (belong to the first generation). However, there is great differences between them externally on colourations and markings. Therefore, a molecular comparison among them is necessary.

##### **8. *Charissa (Euchrognophos) dubitaria* (Staudinger, 1892)**

Original reference: *Gnophos ? dubitaria* Staudinger, 1892, Dt. ent. Z., Iris 5: 192-193. Syntypes: [Iran]: Schahrud; [Türkei]: Mardin.

Synonym: *dubitaria* Staudinger, 1892

Range: Lebanon, Turkey (İçel, Kayseri, Mardin, Siirt, Van), Caucasus countries, Iran.

Material examined: 2♂. **Van** Pr., Tuşba, Ağarti, Gören Mt. 1835m (65Np6), 30.v.2014; 6♂. Van Pr., Bahçesaray, Upper Mukus valley 1840m (65Am4), 3.vi.2016; 2♂. Bahçesaray, Upper Mukus valley 1850m (65Am3), 10.vi.2016 and 24.vi.2016; 8♂. Bahçesaray, Upper Mukus Valley 1840m, 23.vi.2016; 3♂1♀. Bahçesaray, Upper Mukus Valley 1840m, 3.x.2016, GP2926♀; 1♂. Çatak, Saklıvadi 2030m, 8.ix.2016, all by M.Kemal & A.Koçak leg.

**9. *Charissa (Euchrognophos) effendii* (Viidalepp & Piriev, 1993)**

Original reference: *Euchrognophos effendii* Viidalepp & Piriev, 1993, Vestn. Zool. 1993 (4): 80-81.

Type ♀: Azerbaijan, Talysh, Zuvand, Kosmoljan 2000m., 19.09.1990

Synonym: *effendii* Viidalepp & Piriev, 1993

Range: Turkey (Erzurum), Caucasus countries (Bold systems).

**10. *Charissa (Euchrognophos) mucidaria* (Hübner, [1799])**

Original reference: *Geometra mucidaria* Hübner, [1799], Samml. eur. Schmett. 5: pl.28 fig.148.

Type: Europe.

Synonyms: *mucidaria* Hübner, [1799]; *herrichi* Oberthür, 1913; *nubilarius* Reisser, 1936

Range: North Africa, South Europe, Turkey (Muğla, Sivas), Caucasus countries (Bold Systems).

**11. *Charissa (Euchrognophos) nannodes* (Wehrli, 1936)**

Original reference: *Gnophos nannodes* Wehrli, 1936, Am. Papillons 1936: 151-152. Syntypes 9♂ 1♀: [Turquie]: "Wan...", 1900-2200m (ZSM).

Synonym: *nannodes* Wehrli, 1936

Range: Turkey (Van).

Material examined: 3♂ 4♀. Van Pr., Bahçesaray, Upper Mukus Valley 1840m (65Am4), 3.x.2016, GP2417♂, M.Kemal & A.Koçak leg. 3♂, collected by the authors from the same place but on 23.vi.2016, presumably belong to this species.

**12. *Charissa (Euchrognophos) staudingeri* (Wnukowsky, 1929)**

Original reference: *Gnophos dubitaria staudingeri* Wnukowsky, 1929, Zool. Anz. 83: 223 (nomen novum pro *graecaria* Staudinger, 1892 nec Stgr., 1871).

Synonyms: *graecaria* Staudinger, 1892 nec Stgr., 1871; *staudingeri* Wnukowsky, 1929

Range: Greece (Samos, Crete, Peloponese), Turkey (Bold Systems).

Remarks: This species is given from Greece. Besides, uppersides of two specimens (ex ZSM) are simply illustrated from Turkey in the Bold Systems.

**13. *Charissa (Euchrognophos) subtaurica* (Wehrli, 1934)**

Original reference: *Gnophos variegata* var. *subtaurica* Wehrli, 1934, Mitt. münchen. ent. Ges. 24 (2): 54, pl.1 figs. 25,26. Syntypes ♂♀: [Türkei]: Marasch, Akbes; [Lebanon]: Beirut (ZFMK).

Synonyms: #*subtaurica* Wehrli, 1932; *subtaurica* Wehrli, 1934

Range: Greece, Turkey (Adana, Antalya, Diyarbakır (Hazro) (Kemal & Koçak, 2015), Hatay, İçel, Konya, Kahramanmaraş, Muğla; Amasya, Bursa, Siirt, Van records need confirmation), Middle East countries, Cyprus.

There are numerous specimens collected from southern Turkey, which can be confirmed as *subtaurica* or *staudingeri*. However, it is considered inconvenient to make a decision without molecular analyzing (GP2924♀, GP2925♀).

**14. *Charissa (Euchrognophos) symmicta* Wehrli, 1953**

Original reference: *Gnophos symmicta* Wehrli, 1953, [in] Seitz,A., Die Gross-Schmett. Erde 4 (Suppl.): 604. Syntypes 1♂ 1♀: [Russia]: North Kaukasus: Mashuk, River Zeja (ZFMK).

Synonym: *symmicta* Wehrli, 1953

Range: Caucasus countries, Turkey (Artvin, Bolu) (Bold Systems; Özdemir (2007)).

**15. *Charissa (Kemtrognophos) ambiguata* (Duponchel, 1830)**

Original reference: *Gnophos ambiguata* Duponchel, 1830, Histoire naturelle des lépidoptères ou papillons de France 8 (1):223-224, pl. 186 fig.2. Type: France: Basses-Alpes.

Synonyms: *ambiguata* Duponchel, 1830; *meyeraria* Harpe, 1853; *ophthalmicata* Lederer, 1853

Range: Europe, Caucasus countries, Turkey (Amasya [Staudinger, 1879: 456], Çanakkale, Kırklareli), China, Mongolia (Bold Systems).

**16. *Charissa (Kemtrognophos) argillata* (Brandt, 1938)**

Original reference: *Gnophos argillata* Brandt, 1938, Ent. Rdsch. 55: 620-621, fig. 415. Syntypes: Iran, [Fars]: Comée.

Synonym: *argillata* Brandt, 1938

Range: Iran, Turkey (Van) (present record)

Material examined: 1♂. **Van** Pr., Bahçesaray, Liman Populetum 2320m (65Ac3), GP2934♂, 16.vii.2017; 1♂, from same place, 6.viii.2016; 2♂, Bahçesaray, Krapet Pass 2820m, 6.viii.2016, M.Kemal & A.Koçak leg.

Remarks: This species looks very much like to *mardinaria* not only from external, but also from male genitalia. However, it is distinguishable by the short cornutus (less than 1/2 of aedeagus length). This species is presumably found also from Çatak: Saklıvadi (2♂1♀), and Gürpınar: Zernek (1♂1♀) in Van Province.

New for the fauna of Turkey.

#### **17. *Charissa (Kemtrognophos) ciscaucasica (Rjabov, 1964)***

Original reference: *Gnophos ciscaucasica* Rjabov, 1964, [in] Rjabov & Vardikjan, Zool. Sb. Erevan 13: 116-118, figs.

Synonym: *ciscaucasica* Rjabov, 1964

Range: Caucasus, Turkey (Antalya, Artvin, Erzurum, Kars, Rize, Ardahan), Iran, Turkmenistan.

Remarks: This species is apparently confined to Caucasus and NE Turkey (Bold Systems). Antalya record needs confirmation.

#### **18. *Charissa (Kemtrognophos) mardinaria (Staudinger, 1901)***

Original reference: *Gnophos obscuraria* var. *mardinaria* Staudinger, 1901, Cat. Lep. palaearkt. Faunengeb. 3 (1): 345, nr.3931d. Type(s): [Türkei]: Mardin.

Synonym: *mardinaria* Staudinger, 1901

Range: Turkey (Kayseri, Mardin, Siirt; Malatya, Niğde, Van [present records]), North Iraq, Iran.

Material examined: 1♂. **Niğde** Pr., Aladağlar, Cimbar 1660m, GP707♂, A.Koçak leg. & prep.1985; 1♀, **Malatya** Pr., Beydağı NP 1195m (44Lc), 20.vi.2015; 1♀, **Van** Pr., Bahçesaray, Upper Mukus Valley 1840m (65Am4), 3.x.2016; 2♂, Van Pr., Çatak, Saklıvadi 2030m (65Df), GP2416♂, 8.x.2016, M.Kemal & A.Koçak leg.

#### **19. *Charissa (Kemtrognophos) onustaria (Herrich-Schäffer, [1852])***

Original reference: *Gnophos onustaria* Herrich-Schäffer, [1852], Syst. Bearb. Schmett. Eur. 6:73, figs. 496-497. Syntypes: [Türkei]: Amasia.

Synonyms: *onustaria* Herrich-Schäffer, [1852]; *oneraria* Guenée, [1858]

Range: South Europe, Turkey (Amasya, Antalya, Bolu, Bursa, Hatay, Kahramanmaraş, Ordu [Özdemir, 2016], Trabzon, Zonguldak; Elazığ, Siirt, Malatya, Van [present records]), Middle East and Caucasus countries. Iraq, Iran.

Material examined: 1♂ **Elazığ** Pr. (Maden), GP724♂, A.Koçak leg. & prep.1985; 1♀. **Siirt** Pr., Pervari, Kırıkkaya 1155m (56Dd), 13.iv.2013; 1♀. **Siirt** Pr., Şirvan, Nergisli 630m (56Fv), 18.iv.2015; 3♂. **Şirvan** Maden kvş. 960m (56Fb), 17.iv.2015; 3♂. **Malatya** Pr. Beydağı NP 1193m (44Lc), 27.iv.2015; 5♂1♀. **Van** Pr., Gevaş, Göründü N. 1800m, Quercetum, 5.v.2016, GP2933♂; 1♂. Bahçesaray, Vasting 1615m (65An), 9.v.2016; 2♂. Bahçesaray Paşaköy 1600m (65Ai), GP2932♂, 25.v.2016 and 2.vi.2016, all M.Kemal & A.Koçak leg.

#### **20. *Charissa (Kemtrognophos) zeitunaria (Staudinger, 1901)***

Original reference: *Gnophos obscuraria* var. *zeitunaria* Staudinger, 1901, Cat. Lep. palaearkt. Faunengeb. 3 (1): 344, nr.3931c. Type(s): [Türkei]: "Taur.m.or." [=Kahramanmaraş, Süleymanlı (=Zeitun)].

Synonym: *zeitunaria* Staudinger, 1901

Range: Turkey (Ankara, Bitlis [present record], Çankırı, Erzurum, İçel, Konya, Kahramanmaraş, Niğde [present record], Van [present record], Kırıkkale), Caucasus countries.

Material examined: 1♂. **Niğde** Pr., Aladağlar, Cimbar 1660m, GP736♂, A.Koçak leg. & prep. 1985; 1♂. **Van** Pr., Çatak, Saklıvadi 2030m (65Df), GP2411♂, 28.viii.2016, M. Kemal & A.Koçak leg. The genitalia was illustrated by Kemal & Koçak (2017: 43, fig.39); 73♂. **Bitlis** Pr., Adilcevaz, Süphan Mt. Kızdağı 2560m (13Ac1), GP2747♂, 19.viii.2017, M.Kemal, H.Uçak & A.Ö.Koçak leg.; 1♂. **İçel** Pr., Anamur, Çiçekyurdu 1620m (33Ae), GP2761♂, 10.ix.2017, M.Kemal & A.Koçak leg. The male genitalia was illustrated by Kemal & Koçak (2018: 12, fig.27). Further material: 2♂2♀. **İçel** Pr. Anamur, Çiçekyurdu 1620m, 10.ix.2017, all M.Kemal & A.Koçak leg.

**21. *Charissa (Neognophina) pfeifferi* (Wehrli, 1926)**

Original reference: *Gnophos pfeifferi* Wehrli, 1926, Mitt. münchen. ent. Ges. 16: 95-98. Syntypes 3♂ 2♀: [Turkey: Isparta Pr.]: "Egerdir, Anatolien" [it belongs to first generation].

Synonym: *pfeifferi* Wehrli, 1926

Range: Greece, Lebanon, Turkey (Isparta, İçel [present record], Konya, Kahramanmaraş, Karaman).

Material examined: 7♂. **İçel** Pr., Anamur, Kaşyaylaşı Çiçekkyurdu 1620m (33Ae), GP2946♂, 10.ix.2017, M.Kemal & A.Koçak leg.

Remarks: Between first and second generation of *Charissa pfeifferi* no remarkable difference observed.

**22. *Charissa (Neognophina) sp.***

Material examined: 1♂. **Malatya** Pr., Beydağı NP 1190m (44Lc), GP2944♂, 26.iv.2015, M.Kemal & A.Koçak leg.

Remarks: A single male obtained belongs to the vernal generation. The male genitalia looks like *Charissa pfeifferi*; however, the underside markings are remarkably different. A molecular comparison is needed.

**23. *Charissa (Organognophos) wanensis* (Wehrli, 1936)**

Original reference: *Gnophos wanensis* Wehrli, 1936, Mitt. münchen. ent. Ges. 26: 36, Taf.ii. figs. 4,8. Syntypes 4♂ 3♀: [Türkei]: "Umg. Wan, 2400m Ende August, Anf. September".

Synonym: *wanensis* Wehrli, 1936; #*wanensis* Wehrli, 1953

Range: North Iraq, Turkey (Ağrı; Bitlis, Niğde, Van [present records]).

Material examined: 1♂. **Niğde** Pr., Aladağlar, Cimbar 1660m, GP722♂, A.Koçak leg. & prep. 1985;

1♂. **Bitlis** Pr., Adilcevaz, Süphan Mt. Kızdağı 2560m (65Ac1), 19.viii.2017, M.Kemal, A.Koçak & H.Uçak leg.; 1♂. **Van** Pr., Bahçesaray, Upper Mukus Valley 1840m (65Am4), GP2386♂, 3.x.2016, M.Kemal & A.Koçak leg. Kemal & Koçak (2017: 44, fig.62); 1♂, Çatak, Saklıvadi 2030m (65Df) 28.viii.2016, A.Koçak leg.

**24. *Charissa (Rhopalognophos) glauclinaria* (Hübner, [1799])**

Original reference: *Geometra glauclinaria* Hübner, [1799], Samml. Eur. Schmett. 5: pl.28 fig.150.

Type: Europa.

Synonyms: *glaucinaria* Hübner, [1799]; *glaucinata* Treitschke, 1827

Range: South Europe, Turkey (Amasya, İçel) (Staudinger, 1879: 456). The occurrence of this species in Turkey needs confirmation.

**25. *Charissa (s.str.) certhiata* (Rebel & Zerny, 1931)**

Original reference: *Gnophos certhiatus* Rebel & Zerny, 1931, Denkschr. Akad. Wiss. 103: 115-117, figs.1,2,5. Syntypes: Albanien, Montenegro, Herzegowina, Bosnien.

Synonyms: *certhiatus* Rebel & Zerny, 1931; *bezengius* Niesiolowski, 1953; #*certhiana* Rjabov, 1964

Range: South –East Europe, Caucasus countries, Turkey (Konya (Akşehir); Niğde, Van [present records]).

Material examined: 1♂. **Niğde** Pr., Aladağlar, Cimbar 1660m (51Bc), GP711♂, A.Koçak leg. & prep. 1985; 1♂. **Van** Pr., Gevaş, Artos Mt. 2000m (65Fp), 17.viii.2012, M.Kemal & A.Koçak leg.; 2♂, Bahçesaray: Krapet Pass 2820m, 6.viii.2016, GP2412♂, GP2936♂, M.Kemal & A.Koçak leg.

Remarks: The subspecific identity of this species is still uncertain. We need new material of *minorasiatica*, described by Wehrli (1936) as a subspecies from Akşehir (Sultandağları), for molecular comparison.

**26. *Charissa (s.str.) obscurata* ([Denis & Schiffermüller], 1775)**

Original reference: #*Geometra obscurata* [Denis & Schiffermüller], 1775, Ankündung syst. Werkes Schmett. Wienergegend: 108. Type(s): [Austria]: Vienna district [nomen nudum].

Synonyms: #*obscurata* [Denis & Schiffermüller], 1775; *lividata* Fabricius, 1787 nec Cl., 1759; *obscuraria* Hübner, 1799; *anthracinaria* Esper, 1801; *quadripustulata* Donovan, 1808

Range: North Africa, Europe, Caucasus countries, Turkey (Amasya, Bolu, Bursa, Çanakkale, Edirne, İçel, İstanbul, Konya, Düzce) (Staudinger, 1879).

**27. *Charissa (s.str.) zejae (Wehrli, 1953)***

Original reference: *Gnophos certhiathus* ssp. *zejae* Wehrli, 1953, [in] Seitz, A., Gross-Schmett. Erde 4 (Suppl.): 584, fig. 48e. Type: [Armenien]: Fluss Zeja, leg. Rjabov (ZIN, St Petersburg).

Synonym: *zejae* Wehrli, 1953

Range: Turkey (Erzurum), Caucasus countries (Bold Systems).

**28. *Charissa* sp.n.**

Material examined: 9♂ 2♀. **İçel** Pr., Anamur, Çicekyurdu 1620m (33Ae), GP2843♂, GP2924♀, 10.ix.2017, M.Kemal & A.Koçak leg.; 1♂, collected from **Van** Pr., Bahçesaray, Upper Mukus Valley 1840m (65Am4), on 5.viii.2016, presumably belong to this species.

Remarks: The taxonomic status of this species is uncertain. Morphologically it belongs to *Charissa* Curtis temporarily. See above, phylogenetic remarks no 3.

**29. *Gnophos (Dicrognophos) amanensis Wehrli, 1934***

Original reference: *Gnophos snelleni* ssp. *amanensis* Wehrli, 1934, Mitt. münchen. ent. Ges. 24: 50. Syntypes 2♂: [Türkei, Osmaniye]: DülDül Dagh.

Synonym: *amanensis* Wehrli, 1934

Range: Turkey (Osmaniye, Hatay [present record]).

Material examined: 1♂. **Hatay** Pr., Samandağ, Meydan, Karabucak (31Ka3), 9.v.2015, M.Kemal, A.Koçak, O.Sertel & H.Barkou leg.; 1♂, from same place, Fenk altı (31Ka6), GP2406♂, 10.vi.2015, O.Sertel leg.

**30. *Gnophos (Dicrognophos) gorgatus Brandt, 1938***

Original reference: *Gnophos gorgata* Brandt, 1938, Ent. Rdsch. 55: 617-620, figs. 404-408.

Syntypes: Iran: [Fars]: Comée, Sine-Sefid.

Synonym: *gorgata* Brandt, 1938

Range: Turkey (Van [present record]), Iran.

Material examined: 1♂. **Van** Pr., Bahçesaray, Paşaköy 1600m, 25.vi.2016, M.Kemal & A.Koçak leg. GP2927♂, GP2928♀.

**31. *Gnophos (Dicrognophos) pseudosnelleni Rjabov, 1964***

Original reference: *Gnophos pseudosnelleni* Rjabov, 1964, [in] Rjabov & Vardikjan, Zool. Sb. Erevan 13: 108, pls. Holotype ♂: Armenia: River Arpa, Daralagez.

Synonym: *pseudosnelleni* Rjabov, 1964

Range: Caucasus countries, Turkey (Siirt, Tunceli; Bitlis, Van [present records]), Iran.

Material examined: 1♂ 2♀. **Bitlis** Pr. Tatvan, Nemrut Caldera 2350m, 24.vii.2008, L.Kayci & H.Özkol leg.; 11♂. **Van** Pr., Bahçesaray Upper Mukus Valley 1840m (65Am4) 23.vi.2016; 1♂ 1♀, from same place 1840m (65Am4), 5.viii.2016; 1♀, from same place 1780m (65Am1), 6.vii.2016; 2♂, from same place, 1850m (65Am3), 24.vi.2016; 6♂ 1♀. Bahçesaray, Paşaköy 1620m, 25.vi.2016; 1♂, Bahçesaray Liman Populetum 2320m, 6.viii.2016, 3♂, from same place, GP2929♂, 16.vii.2017; 4♂ 1♀. Bahçesaray, Altındere 1935m (65At5) 4.vii.2016; 8♂ 1♀. Başkale, Ziyanis E. 2400m (65Bo) 9.vii.2015; 1♂ (GP2403) Çatak, Saklıvadi 2030m (65Df) 12.vii.2016; 5♂ 1♀ from same place 2030m (65Df) 25.vi.2017; 1♂, Gürpınar, Zernek 1975m (65Gb), 20.vii.2017, all by M.Kemal & A.Koçak leg.

**32. *Gnophos (Dicrognophos) sartatus Treitschke, 1827***

Original reference: *Gnophos sartata* Treitschke, 1827, Schmett. Eur. 6 (1): 175-177. Syntypes ♂♀: [Croatia]: "Dalmatien".

Synonyms: *sartata* Treitschke, 1827; *syriaca* Thierry-Mieg, 1916.

Range: Europe, Caucasus & Middle East countries, Iran, Cyprus, Turkey (Amasya, Ankara, Bursa, Çanakkale, Denizli, Diyarbakır (Hazro) (Kemal & Koçak, 2015), Gaziantep, Hatay, Konya, Kahramanmaraş, Siirt, Van, Osmaniye) (Staudinger, 1879: 455).

Material examined: 1♂. **Diyarbakır** Pr., Hazro, Uzunargit 950m, 16.v.2015, GP2192, M.Kemal & A.Koçak leg.; 2♂. **Hatay** Pr., Samandağ, Karabucak 35m (31Ka3) 9.v.2015 and 12.v.2015; 2♂, same place Gözlüce 35m (31Ka5) 11.v.2015, M.Kemal A.Koçak, O.Sertel, H.Barkou leg.; 1♂, Meydan, Fenkaltı 10.x.2015, O.Sertel leg; 2♂. **Van** Pr., Bahçesaray, Upper Mukus Valley 1840m (65Am4)

23.vi.2016 & 3.x.2016; 1♂, Bahçesaray, Paşaköy 1600m (65Ai), 25.vi.2016, 1♀, same place, 2.x.2016; 1♀, Bahçesaray, Su Fabrikası 1570m (65Aö), 22.x.2016, M.Kemal & A.Koçak leg.

### **33. *Gnophos (Dicrognophos) snelleni* Christoph, 1887**

Original reference: *Gnophos snelleni* Christoph, 1887, [in] Romanoff, Mém. lépid. 3: 96-98, pl. iv fig.13. Syntypes: [Turkmenistan]: "Germob"; [Iran]: "Schahrud".

Synonym: *snelleni* Christoph, 1887

Range: Turkmenistan, North Iran, Iraq. Record from Turkey needs confirmation.

### **34. *Gnophos (Sacrognophos) sacrarius* Staudinger, [1895]**

Original reference: *Gnophos sacraria* Staudinger, [1895], Dt. Ent. Z., Iris 7: 292-293.

Syntypes: 3♂ 8♀. [Israel]: Jerusalem (Paulus leg.).

Synonym: *sacraria* Staudinger, [1895]

Range: Israel, Turkey (Siirt) (Seven, 2018).

### **35. *Gnophos (s.str.) obfuscatus* ([Denis & Schiffermüller], 1775)**

Original reference: #*Geometra obfuscata* [Denis & Schiffermüller], 1775, Ankündung syst. Werkes Schmett. Wienergegend: 108. Type(s): [Austria]: Vienna district. [nomen nudum]

Synonym: #*obfuscata* [Denis & Schiffermüller], 1775

Range: Europe, Caucasus countries, Turkey (Istanbul, Ordu) (Özdemir, 2016).

### **36. *Charissa ? pallescens* (Rjabov, 1964) (comb.n.?)**

Original reference: *Gnophos pallescens* Rjabov, 1964 [in] Rjabov & Vardikjan, Zool. Sb. Erevan 13: 113-115, figs. Type ♂: Russia, Daghestan.

Synonym: *pallescens* Rjabov, 1964

Range: Caucasus countries, Turkey (Kahramanmaraş: Nurhak) (Bold Systems).

### **37. *Odontognophos zacharius* (Staudinger, 1879)**

Original reference: *Gnophos zacharia* Staudinger, 1879, Horae Soc. ent. ross. 14: 454-455. Type ♀: [Türkei]: Amasia.

Synonym: *zacharia* Staudinger, 1879

Range: Caucasus countries, Turkey (Adana, Amasya, Bolu, Hatay, Konya, Kahramanmaraş, Kırıkkale, Niğde, Van [last two provinces are present records]).

Material examined: 1♂. **Niğde** Pr., Aladağlar, Cimbar 1660m, GP739♂, A.Koçak leg. & prep. 1985; 1♂. **Van** Pr., Çatak, Saklıvadi 2030m. (65Df), GP2416♂, Kemal & Koçak (2017: 45, fig.66); 2♂ 1♀, Bahçesaray, Paşaköy 1620m (65Ai), 2.x.2016; 1♀, Bahçesaray, Upper Mukus Valley 1840m (65Am4), 3.x.2016, M.Kemal & A.Koçak leg.

Remarks: *Odontognophos* was established by Wehrli (1951) as a distinct genus. However, its type-species *dumetata* Treitschke is considered as a *Gnophos* species by some authors (Lepiforum).

## **Conclusions**

In general, much more material from all parts of Turkey is needed for further faunistical information about the *Gnophini*.

Taxonomically, there are species which appear to be undescribed. In order to clarify their precise identity, further studies are needed, molecular assisted.

For the time being, the status of the following taxa are briefly mentioned below:

The genital morphology of *Charissa (Neognophina)* sp. similar to *pfeifferi*, however, the underside markings are remarkably different from it. Therefore, it couldnot be decided about its specific identity. More material from the region and also a molecular comparison is needed for the precise identification.

The subspecific identity of *Charissa certhiata* in East Turkey is uncertain. We need new material of *minorasiatica*, described by Wehrli (1936) as a subspecies from Akşehir (Sultandağları), for molecular comparison.

The taxonomic status of *Charissa* sp. n. is currently uncertain. In order to clarify its status, more material from various parts of Turkey and morphological researches, molecular assisted, are needed.

Morphologically, still unidentified specimens may be classified under two following *Charissa* taxa:

*Charissa* sp.1

- 3♀. Siirt Pr., Şirvan, Nergisli 630m, 18.iv.2015;
- 1♀. Siirt Pr., Şirvan, Maden Pass SW (56Fm), 19.iv.2015;
- 1♂. Siirt Pr., Şirvan, Maden kvş. (56Fb), 17.iv.2015 (GP2945♂);

1♂. Malatya Pr. Beydağı NP 1190m (44Lc), 26.iv.2015, all by M.Kemal & A.Koçak leg. The genital morphology resembles to *subtaurica*; however, all *subtaurica* populations need molecular analysis.

*Charissa* sp.2

- 1♂. Hakkari Pr., Dağlıca 1545m (30Df), 23.vii.2017, H.Uçak leg.

In the present paper, there are several names of various taxa, which is nomenclaturally unavailable according to the current ICZN Rules. If the truths need to be discussed, not the applications, the following unavailable names must be cited:

- Geometra furvata* [Denis & Schiffermüller], 1775  
*Geometra obscurata* [Denis & Schiffermüller], 1775  
*Geometra obfuscata* [Denis & Schiffermüller], 1775

These names are binominal, however, they havenot been described originally; therefore they must be considered as *nomina nuda* (Koçak, 1982-1987).

Finally, *Hyposcotis* Hübner,[1825] has been established available earlier than *Charissa* Curtis,1826. On the other hand, it has still priority over the name *Euchrognophos* Wehrli,1951. The type-species of both generic names are currently congeneric, i.e., *Euchrognophos* Wehrli (type-species: *Gnophos variegata* Dup.), *Hyposcotis* Hübner (type-species: *Geometra mucidaria* Hbn.).

Faunistically, *Charissa* (*Neognophina*) sp. is temporarily placed in the faunal list. Separately, *Charissa* (*Rhopalognophos*) *glaucinaria* and *Gnophos* (*Dicroglyphos*) *snelleni* need confirmation for the fauna of Turkey.

The present study is an initiary one on this group. Further studies on the fauna, taxonomy on the problematic groups have already been planned. As the currently obtained taxonomical and molecular information are not final, but interim results; they will not be shared until our research about this group ends.

## References

- Brandt,W.**, 1938, Beitrag zur Lepidopteren-Fauna von Iran. Neue Gattungen, Arten und Formen (Macrolepidoptera). *Ent. Rdsch.* 55: 497-505, 516-523, 548-554, 558-561, 567-574, 584-588, 597-602, 616-621, 632-634, 671-675, 698-699, 701-702, Abb. & Taf.
- Christoph,H.**, 1885, Lepidoptera aus dem Achal-Tekke Gebiete 2.Theil. [in] Romanoff, *Mém. Lépid.* 2: 119-171, Pls. vi-viii,xv.
- Curtis,J.**, 1823-1840, *British Entomology, being illustrations and descriptions of the genera of insects found in Great Britain and Ireland; containing col. figs. from nature of the most rare and beautiful species, and ...16 vols. 770 pls.* London.
- [**Denis,M. & I.Schiffermüller**], 1775, *Ankündigung eines systematischen Werkes von den Schmetterlingen der Wiener Gegend.* 322 pp. 2 Pls. Wien.
- Duponchel,P.A.J.**, 1830-1832, *Histoire naturelle des Lépidoptères, ou papillons de la France.* Vol.8 (1). *Phalenites.* 597 pp., tab. 171-210, Paris.
- Duponchel,P.A.J.**, 1844-[1846], *Catalogue méthodique des Lépidoptères d'Europe.* 523 pp. Paris.  
**Genbank:** <https://www.ncbi.nlm.nih.gov/> [last access, on 18.iii.2018]
- Herrich-Schäffer,G.A.W.**, 1843-[1856], *Systematische Bearbeitung der Schmetterlinge von Europa, zugleich als Text, Revision und Supplement zu Jacob Hübner's Sammlung europäischer Schmetterlinge.* 6 vols. Regensburg.
- Hübner,J.**, 1796-[1838], *Sammlung europäischer Schmetterlinge.* vol. 5, *Geometrae:* 113 Pls., Augsburg.

- Hübner, J.**, 1816-[1826], *Verzeichnis bekannter Schmetterlinge*. 431 pp., Augsburg.
- Kemal, M. & A.Ö.Koçak**, 2015, First annotated list of the Lepidoptera recorded in Hazro district (Diyarbakır Prov., SE Turkey). *Cesa News* 109: 1-91, 69 figs., 87 maps.
- Kemal, M. & A.Ö.Koçak**, 2016, On the Geometridae fauna of Bahçesaray district, together with some morphological and eco-faunistical notes (Van Province, East Turkey) (Lepidoptera). *Priamus* 14 (2): 76-119, 69 figs. 32 maps.
- Kemal, M. & A.Ö.Koçak**, 2017a, On the Lepidoptera fauna of a single locality, Saklıvadi (Van Province, East Turkey). *Priamus* 15 (1): 1-80, 101 figs., 45 maps, 1 Tab.
- Kemal, M. & A.Ö.Koçak**, 2017b, On the moths of Mutki district (Bitlis Province, East Turkey) (Lepidoptera). *Cesa News* 150: 2-46, 93 figs.
- Kemal, M. & A.Ö.Koçak**, 2017c, On the Microlepidoptera of Bahçesaray district (Van Province, East Turkey). *Priamus* 15 (3): 125-164, 105 figs.
- Kemal, M. & A.Ö.Koçak**, 2017d, Description of a new species, *Loxostege ayhanana* sp. n. from East Turkey (Lepidoptera, Pyraloidea). *Misc. Pap.* 164: 1-4, 7 figs.
- Kemal, M. & A.Ö.Koçak**, 2017e, Description of a new species of the genus *Pleurota* Hbn. from East Turkey (Lepidoptera, Oecophoridae). *Misc. Pap.* 165: 1-3, 3 figs.
- Kemal, M. & A.Ö.Koçak**, 2018a, On the *Stueningia* species in Turkey (Lepidoptera, Geometridae). *Cesa News* 151: 1-3, 2 figs. 1 map
- Kemal, M. & A.Ö.Koçak**, 2018b, New faunistic records of *Diceratura* Diakonoff in Turkey (Tortricidae, Lepidoptera). *Cesa News* 152: 1-4, 10 figs. 1 Table.
- Kemal, M. & A.Ö.Koçak**, 2018c, Annotated list of the moth fauna of Anamur district (İçel Prov., South Turkey), with descriptions of new species (Lepidoptera). *Misc. Pap.* 167: 1-45, 73 figs., 1 map.
- Kemal, M. & H.Uçak**, 2018, Description of a new species of the genus *Wehrliola* Strand in East Turkey (Lepidoptera, Geometridae). *Misc. Pap.* 168: 1-4, 11 figs.
- Kemal, M., Koçak,A.Ö. & H.Uçak**, 2017, On a collection of Lepidoptera from Dağlıca (South-East Turkey, Hakkari Province). *Cesa News* 139: 1-24, 42 figs.
- Kemal, M., Kızıldağ,S. & A.Ö.Koçak**, 2018a, Preliminary list of the Lepidoptera of Posof district (Ardahan Province, NE Turkey). *Cesa News* 156: 1-11, 8 figs.
- Kemal, M., Kızıldağ,S. & A.Ö.Koçak**, 2018b, Preliminary list of the Lepidoptera of Zernek, with some faunistical, taxonomical, and molecular remarks (East Turkey, Van Province). *Misc. Pap.* 171: 1-16, 41 figs.
- Kemal, M., Koçak,A.Ö. & H.Uçak**, 2018, On the Lepidoptera fauna of Elmalık village (Edremit, Van Province, East Turkey). *Priamus* 16 (2): 43-63, 46 figs.
- Kemal, M., Yıldız, I., Kızıldağ,S., Uçak,H. & A.Ö.Koçak**, 2018, Taxonomical and molecular evaluation of *Apochima* Agassiz in East Turkey, with a description of a new genus (Lepidoptera, Geometridae, Ennominae). *Misc. Pap.* 169: 1-13, 1 Table, 27 figs., 1 map.
- Koçak,A.Ö.**, 1982-1987, On the validity of the species group names proposed by Denis & Schiffermüller, 1775 in "Ankündung (sic!) eines systematischen Werkes von den Schmetterlingen der Wiener Gegend". *Priamus* 2 (1): 4-42; 3 (3): 98-130; 3 (4): 133-154; 4 (1/2): 22-36; 4 (3): 81-86.
- Koçak,A.Ö. & M.Kemal**, 2015, List of the genera of the Geometridae of Turkey (Lepidoptera). *Cesa News* 118: 1-16.
- Kumar S., Stecher G. & K.Tamura**, 2016, MEGA7: Molecular Evolutionary Genetics Analysis Version 7.0 for Bigger Datasets. *Mol. Biol. Evol.* 33 (7): 1870-1874.
- Lepiforum e.V.** 2018, Bestimmungshilfe für die in Europa nachgewiesenen Schmetterlingsarten. [latest access: 18.1.2018] [http://www.lepiforum.de/lepiwiki.pl?Lepiforum\\_E\\_V](http://www.lepiforum.de/lepiwiki.pl?Lepiforum_E_V)
- Özdemir, M.**, 2007, Studies on the Geometridae fauna of the Provinces Bolu and Düzce in North-West Turkey (Lepidoptera). *Priamus Suppl.* 7: 1-154, figs.
- Özdemir, M.** 2016, Contributions to the knowledge of Geometridae fauna (Lepidoptera) of Ordu province. *Bitki Koruma Bült.* 56 (2): 209-225.
- Ratnasingham,S. & P.D.N.Hebert**, 2007, Barcoding Bold: The Barcode of Life Data System ([www.barcodinglife.org](http://www.barcodinglife.org)). *Molecular Ecology Notes* 2007: 355-364.
- Rebel,H. & H.Zerny**, 1931, Die Lepidopterenfauna Albaniens (mit Berücksichtigung der Nachbargebiete). *Denkschr. Akad. Wiss. Wien* 103: 37-161, 1 Taf., 1 Karte, 10 textfigs.
- Rjabov,M.A. & S.A.Vardikyan**, 1964, Caucasian species of the genus *Gnophos*. *Zool. Sb. Erevan* 13: 105-147, figs.
- Romanoff,N.M.**, 1884-1887, Les Lépidoptères de la Transcaucasie I-III. [in] Romanoff, *Mém. lépid.* 1: 1-92, Pls.; 2: 1-118, Pls.; 3: 1-49, Pls.
- Ronquist F. & J.P.Huelsenbeck**, 2003, MRBAYES 3: Bayesian phylogenetic inference under mixed models. 19: 1572-1574.
- Seven,E.**, 2018, Notes on some species of *Gnophini* (Ennominae, Geometridae, Lepidoptera) from Turkey, with new records. *J. Ent. Res. Soc.* 20 (1): 53-58, figs.

- Staudinger,O.**, 1878-1879, Lepidopteren-Fauna Kleinasiens. *Horae Soc. ent. ross.* 14: 176-482.
- Staudinger,O.**, 1892, Neue Arten und Varietäten von paläarktischen Geometriden aus meiner Sammlung. *Dt. ent. Z., Iris* 5 (1): 141-260.
- Staudinger,O.**, 1895, Neue Lepidopteren-Arten und Varietäten dem paläarktischen Faunengebiet. *Dt. ent. Z., Iris* 7 (1894): 241-296, Taf.
- Staudinger,O.**, [1898], Neue Lepidopteren aus Palaestina. *Dt. ent. Z., Iris* 10 (1897): 271-319 [1898], Taf.iv[1897]
- Staudinger,O.**, 1901, I.Theil: *Famil. Papilionidae-Hepialidae*. [in] Staudinger,O. & H.Rebel, *Catalog der Lepidopteren des palaeearctischen Faunengebietes*. xxx+[2]+411S. Berlin.
- Treitschke,F.**, 1825, *Die Schmetterlinge von Europa* (Fortsetzung von Ochsenheimers Werk). 5 (2), 447 pp. Leipzig.
- Treitschke,F.**, 1827, *Die Schmetterlinge von Europa* (Fortsetzung von Ochsenheimers Werk). 6 (1), 444 pp. Leipzig.
- Viidalepp,J. & A.A.Piriev**, 1993, A new geometrid moth species (Lepidoptera, Geometridae) from Talysh. *Vestn. zool.* 1993 (4): 80-81, figs.
- Wehrli,E.**, 1921, *Gnophos intermedia* Wrli., bona species, und die *glaucinaria*-Gruppe. *Ent. Z. Frankf. a. M.* 35 (7): 25-26; (8): 29-30, 9 figs.
- Wehrli,E.**, 1926, Eine neue Gnophosart aus Anatolien [*Gnophos pfeifferi* sp.n.]. *Mitt. münchen. ent. Ges.* 16: 95-98.
- Wehrli,E.**, 1931, Einige neue paläarktische Geometriden aus Syrien, Algerien und Sicilien (Lepid., Het.). *Mitt. münchen. ent. Ges.* 21 (2): 41-46.
- Wehrli,E.**, 1934, Die Geometriden der Ausbeute des Herrn Ernst Pfeiffer und Herrn L.Osthelder München aus Marasch und Bertiz Jaila, Achyr Dagh, Südost Taurus. [In] Osthelder,L. & E.Pfeiffer, Lepidopteren-Fauna von Marasch in türkisch Nordsyrien. *Mitt. münchen. ent. Ges.* 24: 1-18, 25-55, 2 Pls.
- Wehrli,E.**, 1936, Nouvelles espèces et races de Geometridae peuvenant des monts Elburs, du Caucase et de l'Asie Mineure. *Amat. Papillons* 1936: 151-155.
- Wehrli,E.**, 1939, Einige neue Arten und Rassen aus dem südwestlichen Iran und aus dem Irak, sowie ein neues Subgenus aus dem letzteren (Lepidoptera, Geometridae). *Mitt. münchen. ent. Ges.* 29 (1): 69-77.
- Wehrli,E.**, 1939-1954, Subfamilie: *Geometrinae*. [In] Seitz,A., *Die Gross-Schmetterlinge der Erde* (Suppl.) 4: 254-685, Pls. Stuttgart.
- Wehrli,E.**, 1951, Une nouvelle classification du genre *Gnophos* Tr. *Lambillionea* 51 (1/2): 6-11; (3/4): 22-30; (5/8): 34-37.
- Wnukowsky,W.**, 1929, Einige Nomenklatur-Notizen über die paläarktischen Lepidopteren. *Zool. Anz.* 83: 221-224.

**Contents:** Kemal, M., Kızıldağ, S. & A. Ö. Koçak, Some molecular phylogenetic and taxonomical remarks on the *Gnophini* of Turkey, with faunistical notes (*Lepidoptera, Geometridae, Ennominae*), p.1 - **editorial**, p.16.

## MISCELLANEOUS PAPERS

**ISSN 1015-8235**

**Miscellaneous Papers** is a peer reviewed online serial of the Centre for Entomological Studies Ankara, established in 1989. It appears at irregular interval in a year, as PDF format and includes original articles of the research workers of the Centre, regarding on various subjects on Entomology (taxonomy, nomenclature, checklist, fauna, biodiversity, distribution, biogeography, ecology, insect-plant interactions, bionomy, and behaviour).

The CESA is a non-profit group, no royalties will be paid to authors of contributions. Papers accepted become the copyright of the related serial.

Miscellaneous Papers is currently archived online at "Internet Archive", in accordance with the publication rules of the ICZN. It is an open-access serial, distributed under the terms of the "*Creative Commons Attribution License*", which permits free use, and distribution in any medium, provided the original author(s) and source are credited.

## Centre for Entomological Studies Ankara



(A scientific Consortium)  
(co-operation of research workers for pure-scientific, not commercial purpose)

Web Page of the Cesa: <http://www.cesa-tr.org/>

**Scientific Serials:** Priamus & Priamus Supplement (print and online versions) (ISSN 1015-8243)<sup>5</sup>, Miscellaneous Papers (print and online versions) (ISSN 1015-8235)<sup>6</sup>, Memoirs (print and online versions) (ISSN-8227)<sup>7</sup> DVD Films<sup>8</sup>, Iconographia Insectorum<sup>9</sup> (online), Cesa Publications on African Lepidoptera (online)<sup>10</sup>, Cesa News (online)<sup>11</sup>, Cesa Books (online)<sup>12</sup>

**Owners / Sahipleri - Editors / Yayıncılar:** Prof. em Dr Ahmet Ömer Koçak (c/o Van Yüzüncü Yıl University, Van, Turkey), Asst. Prof. Dr Muhabbet Kemal Koçak (c/o Van Yüzüncü Yıl University, Van, Turkey).

**Editorial Board of all Scientific Serials of the CESA / Bütün Bilimsel Yayınların Yayın Kurulu:** Insecta, taxonomy, nomenclature, ecology, faunistics: Prof. Dr Ahmet Ömer Koçak (c/o Van Yüzüncü Yıl Üniversitesi, Turkey), Asst. Prof. Dr Muhabbet Kemal Koçak (Van Yüzüncü Yıl University, Turkey).

**Chief referees of all Scientific Serials of the CESA:** Prof. em Dr Ahmet Ömer Koçak & Asst. Prof. Dr Muhabbet Kemal Koçak: Insecta, taxonomy, nomenclature, fauna, ecology, catalogues, checklists of the Old World.

**Expert referees according to the subject areas:** Dr Peter Huemer (Austria): Gelechiidae, and some Microlepidoptera groups in Palaearctic (Lepidoptera). Dr J. B. Hepner (U.S.A.): Microlepidoptera of Nearctic and Neotropical. Dr G. Baldizzone (Italy): Coleophoridae (Lepidoptera). Dr V. Korneyev (Ukraine): Tephritidae, Pyrgotidae, Ulidiidae (Diptera). Prof. Dr Y.G. Verves (Ukraine): Sarcophagidae (Diptera). Dr Daniel Burckhardt (Switzerland): Psyllidae (Homoptera). Prof. Dr E. Heiss (Austria): Hemiptera. Dr R. Ehrmann (Germany): Mantodea. Prof. Dr Mustafa Ünal (Bolu, Turkey): Orthoptera. Prof. Dr Hüseyin Özdkmen (Turkey): Coleoptera. Prof. Dr Suat Kiyak (Turkey): Hemiptera.

**Plant taxonomy, flora and vegetation:** Assoc. Prof. Dr Murat Ünal, Asst. Prof. Dr Mesut Pınar, (Yüzüncü Yıl University, Van, Turkey).

**Molecular studies:** Dr Sibel Kızıldağ (Van Yüzüncü Yıl University, Van, Turkey).

**Editorial policy:** The submitted manuscript is evaluated by the Chief Editor and Referee. In case of need, the manuscript is sent to expert referees according to the subject areas.

**ALL RIGHTS RESERVED**

Correspondences should be addressed to: Prof. em Dr Ahmet Ömer Koçak, c/o Yüzüncü Yıl University, Fen Fakültesi, Biyoloji Bölümü, Kampus, Van / Turkey. - e-mail: [cesa\\_tr@yahoo.com.tr](mailto:cesa_tr@yahoo.com.tr)

All the serials of the Cesa are archived regularly by the Internet Archive (300 Funston Ave., San Francisco, CA 94118, U.S.A.), in accordance with the rules of the International Codes of Zoological Nomenclature (ICZN)  
<https://archive.org/>

also recorded regularly by the Zoological Record, Thomson Reuters, Enterprise House, Innovation Way, Heslington, York, YO10 5NQ, United Kingdom, <https://clarivate.com/>

<sup>5</sup> <http://www.cesa-tr.org/Pri.htm>

<sup>6</sup> <http://www.cesa-tr.org/Miscell.htm>

<sup>7</sup> <http://www.cesa-tr.org/Memoirs.htm>

<sup>8</sup> <http://www.cesa-tr.org/CDF.htm>

<sup>9</sup> <http://www.cesa-tr.org/Icon.htm>

<sup>10</sup> <http://www.cesa-tr.org/CPAL.htm>

<sup>11</sup> <http://www.cesa-tr.org/Cesanews.htm>

<sup>12</sup> <http://www.cesa-tr.org/Cesabooks.htm>